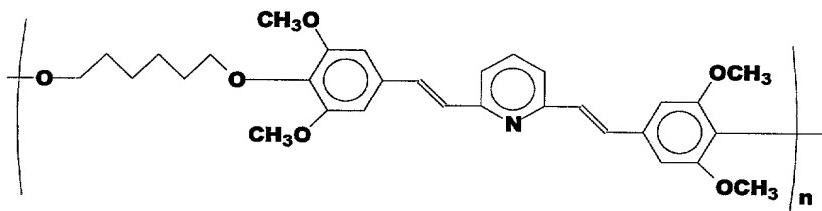


WHAT IS CLAIMED IS:

Polymer 1

1. A composition of matter comprising a polymer of the general structure:

5



10

C/R2/D

A/R1/B

E/R3/F

-(CH₂)_x-/-O(CH₂)_x -/-O(CH₂)_xO-

wherein

15

the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

20

the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

25

wherein bonds A and B may independently be either ortho, meta or para with respect to the pyridyl nitrogen;

30

wherein bonds C and D may be either ortho, meta or para with respect one another; and

wherein bonds E and F may be either ortho, meta or para with respect one another;

35

wherein Y may be a moiety selected from the group consisting of -(CH₂)_x-, -(CH₂)_xO-, -O(CH₂)_x - and -O(CH₂)_xO- wherein x is an integer in the range of 1 to 15 inclusive; and

wherein n is an integer greater than 1.

2. A composition according to claim 1 wherein at least one R2 substituent is a methoxy group.

5 3. A composition according to claim 1 wherein at least two R2 substituents are methoxy groups.

10 4. A composition according to claim 1 wherein at least one R3 substituent is a methoxy group.

15 5. A composition according to claim 1 wherein at least two R3 substituents are methoxy groups.

20 6. A composition according to claim 1 wherein vinyl linkage A attaches at a position ortho to the pyridyl nitrogen.

25 7. A composition according to claim 1 wherein vinyl linkage B attaches at a position ortho to the pyridyl nitrogen.

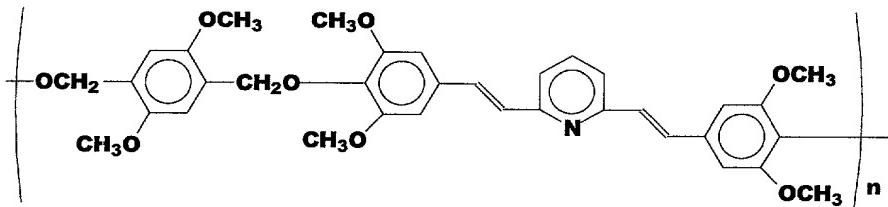
8. A composition according to claim 1 wherein vinyl linkage A attaches at a position para to the pyridyl nitrogen.

9. A composition according to claim 1 wherein vinyl linkage B attaches at a position para to the pyridyl nitrogen.

25 10. A composition according to claim 1 wherein x is an integer in the range of 1 to 6 inclusive.

Polymer 2

30 11. A composition of matter comprising a polymer of the general structure:



35

R4

C/R2/D

A/R1/B

E/R3/F

$-(CH_2)_x-$ - $O(CH_2)_x$ - $-(CH_2)_xO-$

wherein

5

the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

10

the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

15

the R4 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

wherein bonds A and B may be either ortho or para with respect to the pyridyl nitrogen;

20

wherein bonds C and D may independently be either ortho, meta or para with respect one another;

25

wherein bonds E and F may be either ortho, meta or para with respect one another;

wherein bonds G and H may be either ortho, meta or para with respect one another;

30

wherein Y may be a moiety selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x$ – and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive;

wherein Z may be a moiety selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x$ – and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive; and

35

wherein n is an integer greater than 1.

12. A composition according to claim 11 wherein at least one R2 substituent is a methoxy group.

40

13. A composition according to claim 11 wherein at least two R2 substituents are methoxy groups.

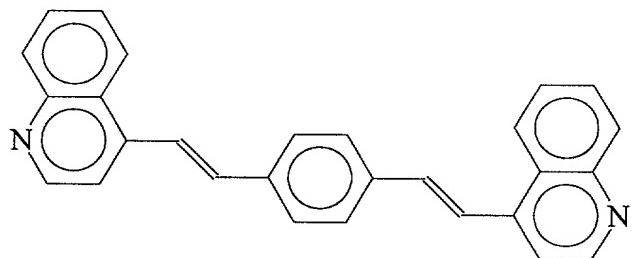
14. A composition according to claim 11 wherein at least one R3 substituent is a methoxy group.

45

15. A composition according to claim 11 wherein at least two R3 substituents are methoxy groups.
- 5 16. A composition according to claim 11 wherein at least one R3 substituent is a methoxy group.
- 10 17. A composition according to claim 11 wherein at least two R3 substituents are methoxy groups.
- 15 18. A composition according to claim 11 wherein vinyl linkage A attaches at a position ortho to the pyridyl nitrogen.
- 20 19. A composition according to claim 11 wherein vinyl linkage B attaches at a position ortho to the pyridyl nitrogen.
- 25 20. A composition according to claim 11 wherein vinyl linkage A attaches at a position para to the pyridyl nitrogen.
- 30 21. A composition according to claim 11 wherein vinyl linkage B attaches at a position para to the pyridyl nitrogen.
- 35 22. A composition according to claim 11 wherein x is an integer in the range of 1 to 6 inclusive.

Oligomers 1, 2, 3 & 4

23. A composition of matter comprising an oligomer of the general structure:



R3/R2 C A R1 B D R4/R5

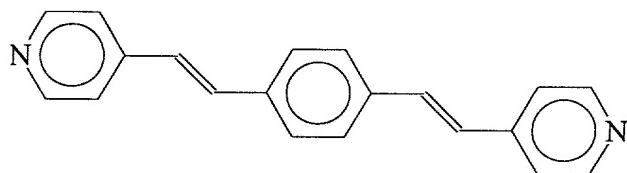
35 wherein

- 10
15
20
25
30
- the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 5 the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 10 the R4 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- the R5 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 15 wherein bonds A and B may independently be either ortho, meta or para from one another;
- wherein bond C may be either ortho, meta or para with respect to the respective quinoyl nitrogen; and
- wherein bond D may be either ortho, meta or para with respect to the respective quinoyl nitrogen.
24. A composition according to claim 23 wherein at least one R1 substituent is a methoxy group.
25. A composition according to claim 23 wherein at least two R1 substituents are methoxy groups.

Oligomer 5, 6, 7 & 8

26. A composition of matter comprising an oligomer of the general structure:

35



R2 C A R1 B D R3

wherein

5 the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

10 the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

15 wherein bonds A and B may independently be either ortho, meta or para from one another;

20 wherein bond C may be either ortho, meta or para with respect to the respective pyridyl nitrogen; and

25 wherein bond D may be either ortho, meta or para with respect to the respective pyridyl nitrogen.

27. A composition according to claim 26 wherein at least one R1 substituent is a methoxy group.

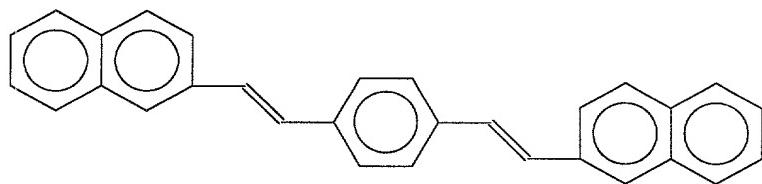
28. A composition according to claim 26 wherein at least two R1 substituents are methoxy groups.

30. A composition according to claim 26 wherein at least one R2 substituent is a methyl group.

35. A composition according to claim 26 wherein at least one R3 substituent is a methyl group.

Oligomers 9 & 10

31. A composition of matter comprising an oligomer of the general structure:



5 R3/R2 C A R1 B D R4/R5

wherein

10 the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

15 the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

20 the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

25 the R4 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

30 the R5 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

 wherein bonds A and B may be either ortho, meta or para from one another.

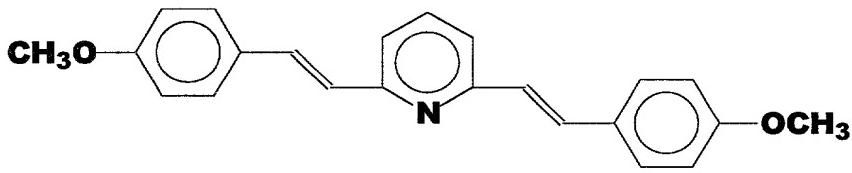
35 32. A composition according to claim 31 wherein at least one R1 substituent is a methoxy group.

 33. A composition according to claim 31 wherein at least two R1 substituents are methoxy groups.

Oligomers 11, 12 & 13

40 34. A composition of matter comprising an oligomer of the general structure:

45



wherein

5 the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

10 the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups; and

wherein bonds A and B may be either ortho or para from the pyridyl nitrogen.

15 35. A composition according to claim 34 wherein at least one R2 substituent is a methoxy group.

20 36. A composition according to claim 34 wherein two R2 substituents are methoxy groups.

25 37. A composition according to claim 34 wherein three R2 substituents are methoxy groups.

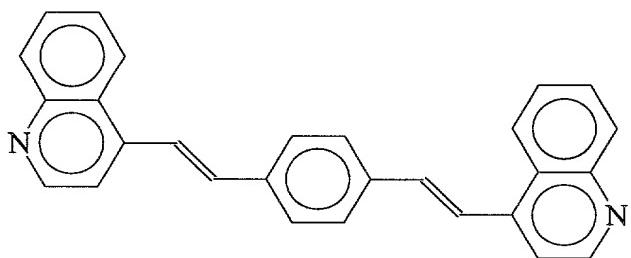
30 38. A composition according to claim 34 wherein at least one R3 substituent is a methoxy group.

39. A composition according to claim 34 wherein two R3 substituents are methoxy groups.

40. A composition according to claim 34 wherein three R2 substituents are methoxy groups.

Block Co-polymer of Oligomers 1, 2, 3 & 4 (Y only)

35 41. A composition of matter comprising a block co-polymer of the general structure:



R3/R2 C A R1 B D R4/R5

wherein

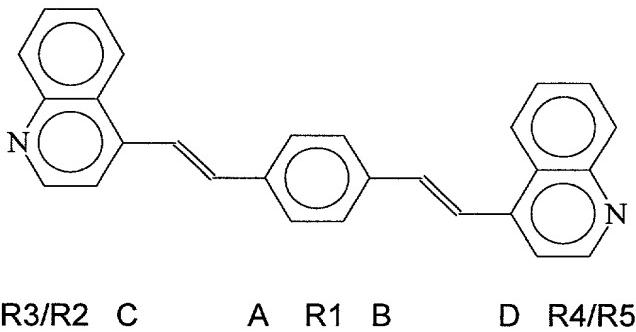
- 5 the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 10 the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 15 the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 20 the R4 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 25 the R5 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- wherein bonds A and B may independently be either ortho, meta or para from one another;
- wherein bond C may be either ortho, meta or para with respect to the respective quinoyl nitrogen; and
- wherein bond D may be either ortho, meta or para with respect to the respective quinoyl nitrogen;
- 30 wherein Y may be a moiety attached at any point on rings R2 and R3, and may be selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x-$ and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive; and
- 35 wherein n is an integer greater than 1.
42. A composition according to claim 41 wherein at least one R1 substituent is a methoxy group.

43. A composition according to claim 41 wherein at least two R1 substituents are methoxy groups.

5 wherein Y may be a moiety selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$,
-O(CH₂)_x- and -O(CH₂)_xO- wherein x is an integer in the range of 1 to 15 inclusive;

Block Co-polymer of Oligomers 1, 2, 3 & 4 (Y, R & Z)

10 44. A composition of matter comprising a block co-polymer of the general structure:



wherein

15 20 the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

25 the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

30 the R4 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

the R5 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

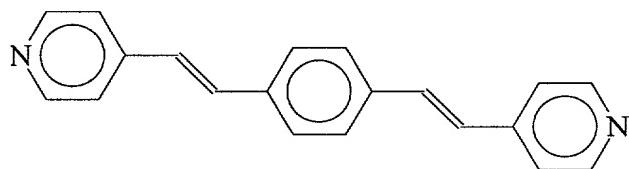
35 the R6 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

wherein bonds A and B may independently be either ortho, meta or para from one another;

- wherein bond C may be either ortho, meta or para with respect to the respective quinoyl nitrogen; and
- 5 wherein bond D may be either ortho, meta or para with respect to the respective quinoyl nitrogen;
- 10 wherein Y may be a moiety attached at any point on ring R6, and may be selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x-$ and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive;
- 15 wherein Z may be a moiety bridging any two points on rings R2 or R3 and R6, and may be selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x-$ and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive; and
- 20 wherein n is an integer greater than 1.
45. A composition according to claim 44 wherein at least one R1 substituent is a methoxy group.
46. A composition according to claim 44 wherein at least two R1 substituents are methoxy groups.

Block Co-polymer of Oligomers 5, 6, 7 & 8 (Y only)

- 25 47. A composition of matter comprising a block co-polymer of the general structure:



30 R2 C A R1 B D R3

35 wherein
the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

5 the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

wherein bonds A and B may independently be either ortho, meta or para from one another;

10 wherein bond C may be either ortho, meta or para with respect to the respective pyridyl nitrogen;

wherein bond D may be either ortho, meta or para with respect to the respective pyridyl nitrogen;

15 wherein Y may be a moiety attached at any point on ring R2, and may be selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x-$ and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive;

20 and

wherein n is an integer greater than 1.

25 48. A composition according to claim 47 wherein at least one R1 substituent is a methoxy group.

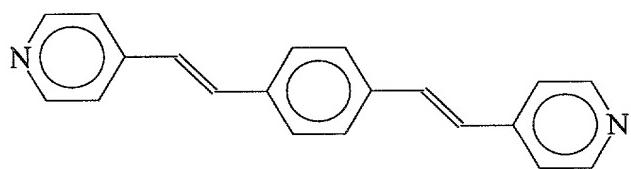
49. A composition according to claim 47 wherein at least two R1 substituents are methoxy groups.

30 50. A composition according to claim 47 wherein at least one R2 substituent is a methyl group.

51. A composition according to claim 47 wherein at least one R3 substituent is a methyl group.

Block Co-polymer of Oligomers 5, 6, 7 & 8 (Y, R & Z)

52. A composition of matter comprising a block co-polymer of the general structure:



R2 C A R1 B D R3

5 wherein

the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

10 the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

15 the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

20 the R4 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

wherein bonds A and B may independently be either ortho, meta or para from one another;

25 wherein bond C may be either ortho, meta or para with respect to the respective pyridyl nitrogen;

wherein bond D may be either ortho, meta or para with respect to the respective pyridyl nitrogen;

30 wherein Y may be a moiety attached at any point on ring R4, and may be selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x-$ and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive;

35 wherein Z may be a moiety bridging any two points on rings R2 and R4, and may be selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x-$ and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive; and

and

wherein n is an integer greater than 1.

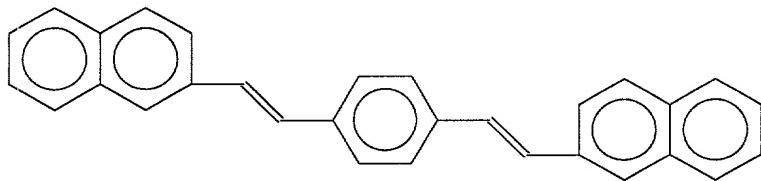
40 53. A composition according to claim 52 wherein at least one R1 substituent is a methoxy group.

54. A composition according to claim 52 wherein at least two R1 substituents are methoxy groups.
- 5 55. A composition according to claim 52 wherein at least one R2 substituent is a methyl group.
56. A composition according to claim 52 wherein at least one R3 substituent is a methyl group.

10

Block Co-polymer of Oligomers 9 & 10 (Y only)

57. A composition of matter comprising a block co-polymer of the general structure:



R3/R2 C A R1 B D R4/R5

20 wherein

- the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 25 the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 30 the R4 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 35 the R5 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

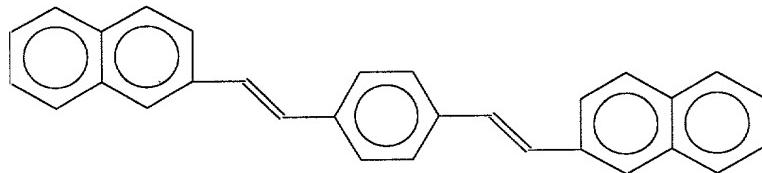
- wherein bonds A and B may be either ortho, meta or para from one another;
- 5 wherein Y may be a moiety attached at any point on rings R2 or R3, and may be selected from the group consisting of -(CH₂)_x-, -(CH₂)_xO-, -O(CH₂)_x- and -O(CH₂)_xO- wherein x is an integer in the range of 1 to 15 inclusive;
- and
- 10 wherein n is an integer greater than 1.

58. A composition according to claim 57 wherein at least one R1 substituent is a methoxy group.

15 59. A composition according to claim 57 wherein at least two R1 substituents are methoxy groups.

Block Co-polymer of Oligomers 9 & 10 (Y, R and Z only)

60. A composition of matter comprising a block co-polymer of the general structure:



R3/R2 C A R1 B D R4/R5

- 25 wherein
- the R1 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 30 the R2 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;
- 35 the R3 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

the R4 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

5 the R5 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

the R6 substituents are independently selected from the group consisting of hydrogen, alkyl groups, alkoxy groups, and aryl groups;

10 wherein bonds A and B may be either ortho, meta or para from one another;

15 wherein Y may be a moiety attached at any point on ring R6, and may be selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x-$ and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive;

20 wherein Z may be a moiety bridging any two points on rings R2 or R3 and R6, and may be selected from the group consisting of $-(CH_2)_x-$, $-(CH_2)_xO-$, $-O(CH_2)_x-$ and $-O(CH_2)_xO-$ wherein x is an integer in the range of 1 to 15 inclusive; and

and

wherein n is an integer greater than 1.